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Application No.: 10/802,138
Docket No.: UC0403USNA

REMARKS

The following remarks are responsive to the Examiner's rejection in the Office Action dated May 10, 2007.

Status of the claims

The pending claims are 1, 2, 4-9 and 18-20. Claims 3 and 10-17 and 21-23 are canceled. Claim 3 is canceled as its subject matter is incorporated into Claim 1. Claims 10-17 and 21-23 are canceled as drawn to non-elected subject matter.

Claims 1-9 and 18-20 stand rejected.

Amendments to the Claims

Claim 1 is amended to more particularly point out the invention. The claim, as amended, recites that the organic liquid is added in an amount to increase the conductivity. Support for this can be found at page 7, lines 13-27, and in the examples. Claim 1 further incorporates the limitations of Claim 3, now canceled. Claims 18, 19 and 20 are amended to change dependency so as to render them distinct from, and not substantial duplicates of Claims 4, 5, and 9, respectively. Claim 20 is also amended to clarify that the claim is drawn to a composition and therefore within the elected subject matter pursuant to the restriction requirement of the non-final Office Action of 03-14-2007 and Applicants' reply thereto dated 04-16-2007. No new matter is introduced.

Duplicate Claims Warning Overcome

With the foregoing amendments to claims 18 and 19, Applicants respectfully submit that the warning in the Office Action concerning duplication of claims 4 and 5 has been overcome by changing the dependency of claims 18 and 19 to claims 5 and 9, respectively, rather than claim 1. Claim 20 has been amended to specify an aqueous dispersion (rather than a device) and has changed dependency by amendment from claim 1 to claim 8, thereby obviating a similar warning in the future. Applicants submit that claims 18 - 20, as amended, are in proper form and not duplicative. As stated in the MPEP, § 706.03(k), " * * * [C]ourt decisions have confirmed applicant's right to restate (i.e., by plural claiming) the invention in a reasonable number of ways. Indeed, a mere difference in scope between claims has been held to be enough."

Claim Rejections – Nonstatutory Obviousness-Type Double Patenting

(1) Claims 1-9 stand provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 3, 6-9, 11-25 and 28 of copending

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Application No. 10/803,114. A terminal disclaimer is being filed concurrently with this paper to obviate this rejection.

(2) Claims 1-9 stand provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 10/815,054. Applicants respectfully traverse this rejection.

The '054 Application relates to non-aqueous dispersions of conductive polymers and colloid-forming polymeric acids in which there is less than 40% by weight water. Applicants' invention relates to an aqueous dispersion, where aqueous refers to a liquid that has water in major portion. (see Specification at page 5, lines 8-9). In Claim 1, as amended herein, the organic liquid is present in an amount with a weight ratio of 0.3 - 5. Furthermore, there is no teaching or suggestion in the '054 Application of increasing the conductivity of an aqueous dispersion by the addition of organic liquid, in the amounts recited in Claim 1. Applicants respectfully submit that the reference does not teach or suggest Applicants' invention as recited in Claim 1, or in any of the claims dependent thereon.

Applicants respectfully submit that this rejection has been overcome, and request that it be withdrawn and not reapplied.

Claim Rejection – 35 U.S.C. § 102(e)

Claims 1-9 and 18-20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hsu et al, US Published Application 2004/0102577 ("Hsu").

Hsu discloses aqueous dispersion of polythiophenes and colloid-forming polymeric acids, which may be prepared in the presence of a co-dispersing liquid. However, there is no teaching or suggestion in Hsu of increasing the conductivity of an aqueous dispersion by the addition of an organic liquid. Nor is there any suggestion of the specific weight ratio recited in Claim 1, as amended. The ratio specified in amended claim 1 is 0.3 to 5.0 (ratio of organic liquid to total polymer) by weight. In Hsu, the ratio of co-dispersing liquid is by volume, not by weight, and may be from 5% to 50% by volume, or greater than 50% (i.e., less than 60% by volume). The volume percentage would presumably be percent volume with respect to the entire volume of the mixture, regardless when (at what stage of synthesis) the co-dispersing liquid is added. Accordingly, the volume percents and weight percents are directly comparable by their absolute values (which, in any case, are different ranges altogether). Notwithstanding, the percent by volume in Hsu suggests a much greater presence of co-dispersing liquid in relation to conductive polymer than the percent by weight organic liquid in proportion to total polymer as recited in amended claim 1. Further, the additives in Hsu for enhancing the conductivity of the film are

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metal particles and nanoparticles, nanowires, carbon nanotubes, graphite particles or fibers, carbon particles, and combinations thereof (paragraph [0064]). Applicants respectfully submit that the reference does not teach or suggest Applicants' invention as recited in Claim 1, or in any of the claims dependent thereon. Rather, claim 1 recites limitations not disclosed or suggested by Hsu, and therefore, Hsu cannot anticipate the claims under review.

Applicants respectfully submit that this rejection has been overcome, and request that it be withdrawn.

Claim Rejection – 35 U.S.C. § 102/103

Claims 1-4, 8 and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C., § 103(a) as obvious over Jonas, US Patent 5,300,575 ("Jonas"). Applicants respectfully traverse this rejection.

Jonas discloses dispersions of polyethylenedioxythiophene with polyanions. Applicants submit that no colloid-forming polymeric acids are taught or suggested by Jonas. The dispersion particle size cited by the Examiner refers to the polymerized thiophene dispersion. The polymeric acids cited by Jonas are water soluble, and not colloid-forming. Furthermore, there is no teaching or suggestion in Jonas of increasing the conductivity of an aqueous dispersion by the addition of an organic liquid. Therefore, there are no minor modifications in the claims under review that would fall within the purview of the skilled artisan to render the claims unpatentable as obvious over Jonas. Nor is there any suggestion of the specific weight ratio recited in Claim 1, as amended. Applicants respectfully submit that the reference is not anticipatory because it does not disclose or suggest each and every element of the claims, and is not disabling under 103(a) because it does not teach or suggest Applicants' invention as recited in Claim 1, or in any of the claims dependent thereon.

Applicants respectfully submit that this rejection has been overcome based on the claim amendments and foregoing remarks, and request that it be withdrawn.

Claim Rejections – 35 U.S.C. § 103

(1) Claims 1-4, 8, 9 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pickup et al. (Journal of New Materials for Electrochemical Systems, 3, pp 21-26, 2000) ("Pickup"). Applicants respectfully traverse this rejection.

Pickup describes the formation of conducting polymer/polyanion composites. The "PEDOT/Nafion" composite made by Pickup is described as a powder (abstract, and page 23, § 3.1, first paragraph) or "gel-like" (page 23, § 3.1, second paragraph). A gel is defined as a

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colloid in which the disperse phase has combined with the continuous phase to produce a jelly-like product (The Condensed Chemical Dictionary, Van Nostrand Reinhold Company, 7th Ed., 1969, p. 443). The late Dr. Linus Pauling in his textbook General Chemistry (Dover Ed. 1988 at 476) points out that [British chemist Thomas] Graham introduced the words *sol* for a colloidal solution (a dispersion of a solid substance in a fluid medium) and *gel* for a dispersion that has developed a structure that prevents it from being mobile. Powders and gels are not the same as an aqueous dispersion, as recited in Applicants' Claim 1. Pickup states (p. 23, first column, final sentence), that "PEDOT/Nafion* appears to be gel-like with no discrete particles." By extension, then, *aerosols* (dispersions of a solid substance in air) and *emulsions* (colloidal dispersions of one liquid in another) are also distinct states. Furthermore, there is no teaching or suggestion in Pickup of increasing the conductivity of an aqueous dispersion by the addition of an organic liquid. Nor is there any suggestion of the specific weight ratio recited in Claim 1, as amended. The Office Action nowhere cites where Pickup discloses any conductivity enhancing value of either acetonitrile/water or water/isopropanol solvents (recited in Pickup in Table 2). In fact, the "initial conductivity" values for the PEDOT/Nafion* solutions shown in Table 2 are substantially below nearly every other solution disclosed. Accordingly, it would not have been obvious to a skilled artisan to use 0.3 to 5.0% by weight (organic liquid to total polymer) of N-methylpyrrolidone, ethylene glycol, dimethylacetamide, dimethyl formamide, dimethylsulfoxide, and combinations thereof (e.g., claim 6) to enhance conductivity of the aqueous dispersion of, e.g., claim 1, based upon Pickup. In fact, Pickup merely recites certain organic liquids as "Solvent" (Table 2) and does not address composition for any reason, much less for conductivity enhancement. The CP/PA composites to which Pickup is directed (i) provide for cation transport due to the presence of the PA (polyanion) and (ii) are used in supercapacitors in the solid state (hot press bonding to the Nafion* membrane - § 3.3). Applicants respectfully submit that the reference does not teach or suggest Applicants' invention as recited in Claim 1, or in any of the claims dependent thereon.

Applicants respectfully submit that this rejection has been overcome, and request that it be withdrawn.

(2) Claims 1-9 and 18-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohtani et al., U.S. Patent 4,869,979 ("Ohtani"). Applicants respectfully traverse this rejection.

Ohtani discloses a conducting polymer for use in batteries. Polythiophene is listed as a possible conducting polymer and "Nafion" is listed as one of many possible polymer anions. However, there is no teaching in Ohtani of a stable aqueous dispersion of polythiophene/"Nafion". The materials prepared by Ohtani are powders or precipitates, which

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are then pressed into tablet discs. Furthermore, there is no teaching or suggestion in Pickup of increasing the conductivity of an aqueous dispersion by the addition of an organic liquid. Nor is there any suggestion of the specific weight ratio recited in Claim 1, as amended. Applicants respectfully submit that the reference does not teach or suggest Applicants' invention as recited in Claim 1, or in any of the claims dependent thereon.


Applicants respectfully submit that this rejection has been overcome, and request that it be withdrawn.

Conclusion

In view of the foregoing amendments and remarks, Applicants submit that the above referenced application is in condition for allowance. A Notice of Allowance for pending Claims 1, 2, 4-9 and 18-20 is earnestly requested.

Should the Examiner have questions about the contents of this paper or the status of the applications, he is invited to call the undersigned at the telephone number listed below.

Respectfully submitted,


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